

Digital broadcasting receiver

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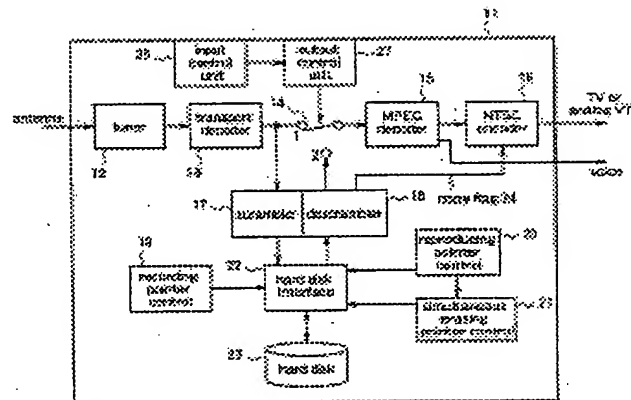


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A digital broadcasting receiver includes a tuner unit for receiving digital broadcasting information, an information storage unit for storing the digital broadcasting information together with copyright information, and a decoder unit for decoding the digital broadcasting information into an output signal in a form to be displayed. When a copy-disallowance signal is detected during an operation for reading and reproducing digital broadcasting information from the information storage unit, by employing a reproducing pointer, the digital broadcasting receiver simultaneously erases the digital broadcasting information by employing a simultaneous erasing pointer. On the other hand, when a copy-disallowance signal is detected while digital broadcasting information is being received and stored in the information storage unit, the digital broadcasting receiver inhibits outputting the received digital broadcasting information as an output signal in a form to be displayed through the decoder unit. Thereby, the digital broadcasting receiver can satisfy the condition of disallowing the copying of copyright protected digital broadcasting by realizing the copyright protection for digital broadcasting information, and can shift a viewing time of the digital broadcasting information to a later time.



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ref. 1

Digital broadcasting receiver

Description of corresponding document: US6694022

BACKGROUND OF THE INVENTION

[0002] 1. Field of the invention

[0003] The present invention relates to a digital broadcasting receiver and, more particularly, to a digital broadcasting receiver which is characterized in that illegal copying is inhibited to be carried out for digital broadcasting which is copyright protected.

[0004] 2. Description of the Related Art

[0005] Conventionally, when a digital broadcasting receiver displays a received video signal, if the received video signal is disallowed to be copied, the digital broadcasting receiver puts a copy-guard on an output video signal which is to be displayed.

[0006] FIG. 7 is a diagram illustrating a structure of a prior art digital broadcasting receiver. In FIG. 7, reference numeral 1 denotes a digital broadcasting receiver. Numeral 2 denotes a tuner. Numeral 3 denotes a transport decoder. Numeral 4 denotes a selector switch. Numeral 5 denotes an MPEG decoder. Numeral 6 denotes an NTSC encoder. Numeral 7 denotes a digital interface. Numeral 8 denotes copy flag information.

[0007] Hereinafter, an operation of the digital broadcasting receiver having such a conventional structure will be described.

[0008] The tuner 2 is connected to an antenna. Digital broadcasting that is received by the tuner 2 is digital-demodulated and the demodulated broadcasting is input to the transport decoder as a data sequence in the form of a transport stream. A plurality of programs and control information are multiplexed in the data sequence in the form of a transport stream. One program is selected among the plurality of programs by the transport decoder 3, and copy flag information as to whether copying to an external recording device is allowed or disallowed is separated from the data sequence in the form of a transport stream. In normal receiving, the selector switch 4 is switched to be connected to a side of the transport decoder. The program data is MPEG-decoded by the MPEG decoder 5, and a digital video image and a voice signal are output. The digital video signal among those is converted into a television signal by the NTSC encoder 6 and the television signal is output. The copy flag information 8 separated by the transport decoder 3 is connected to the digital interface 7 and the NTSC encoder 6. When the copy flag information 8 shows that copying to an external recording device is disallowed, the digital interface 7 inserts information indicating the disallowance of copying into the digital output of the program data. Further, the NTSC encoder 6 inserts a copy protect pulse into the television signal that is output from the NTSC encoder 6.

[0009] As described above, when a received video signal is disallowed to be copied to an external recording device, the prior art digital broadcasting receiver cannot record broadcasting on a VTR or the like. Therefore, a viewer is always required to view broadcasting at the instant time when the broadcasting is received.

[0010] The present invention is made in consideration of the above problems, and it is an object of the present invention to provide a digital broadcasting receiver which enables viewing the broadcasting at a time later than when the broadcasting is received, and which can satisfy a condition of disallowance of copying when the broadcasting which is disallowed to be copied is received.

[0011] In order to solve the above problems, a digital broadcasting receiver according to the present invention comprises: a tuner unit for receiving digital broadcasting information including copyright information, which shows whether copying to an external device is allowed or not, and for detecting the copyright information in the received digital broadcasting information; an information storage unit for storing the received digital broadcasting information together with the copyright information detected in the received digital broadcasting information; and a decoder unit for decoding the received digital broadcasting information or digital broadcasting information read out from the information storage unit into an output signal in a form to be displayed. When a copy-disallowance signal is detected in the digital broadcasting information read out from the information storage unit, the digital broadcasting receiver according to the present invention erases digital broadcasting information which is stored in the information storage unit and which has been successively read out therefrom during a reproduction operation in which the digital broadcasting information is read out from the information storage unit and is reproduced and displayed on a display device.

[0012] In addition, when a copy-disallowance signal included in the copyright information, which is included in the received digital broadcasting information, is detected while the received digital information is stored in the information storage unit, the digital broadcasting receiver, during receiving digital information, inhibits outputting the received digital information as an output signal in a form to be displayed through the decoder unit. Further, when a copy-disallowance signal included in the copyright information, which is included in the received digital information, is detected while the digital information is being stored in the information storage unit, the digital broadcasting receiver outputs a message screen signal, which is prepared in advance, to an output unit for outputting an output signal in a form to be displayed.

[0013] According to the present invention, even when the received video signal is one that is disallowed to be copied to an external recording device, the viewer can view broadcasting at a time later than when the broadcasting is received with the attendant copyright protection at that time being assured.

[0014] In addition, according to the present invention, in order to further assure the copyright protection, outputting of the video signal which is being received is inhibited while the digital broadcasting information

which is disallowed to be copied is being stored, whereby the number of viewing times for the program under the copyright protection is limited to only one time.

SUMMARY OF THE INVENTION

[0015] A digital broadcasting receiver according to a first aspect of the present invention comprises: a tuner unit for receiving digital broadcasting information including copyright information which shows whether copying to an external device is allowed or not and detecting the copyright information included in the received digital broadcasting information; an information storage unit for storing the received digital broadcasting information together with the copyright information detected in the received digital broadcasting information; and a decoder unit for decoding the received digital broadcasting information or digital broadcasting information read out from the information storage unit into an output signal in a form to be displayed. When a copy-disallowance signal is detected in the digital broadcasting information read out from the information storage unit, the digital broadcasting receiver erases digital broadcasting information which is stored in the information storage unit and which has been successively read out therefrom during a reproduction operation for reading out the digital broadcasting information from the information storage unit and reproducing and displaying the same on a display device. Therefore, when received digital broadcasting information is disallowed to be copied to an external recording device, the received digital broadcasting information is internally and temporarily stored, and at the same time when this signal is being output, the digital broadcasting information which has been temporarily stored and successively read out, is simultaneously erased, whereby the copyright protection for the received digital broadcasting information can be realized.

[0016] According to a second aspect of the present invention, the digital broadcasting receiver of the first aspect of the present invention comprises pointer control means for controlling a reading position where information is read out from the information storage unit when digital broadcasting information is reproduced from the information storage unit. The pointer control means includes: a reading pointer for pointing to the reading position where digital broadcasting information is read out from the information storage unit, and an erasing pointer for pointing to a position where the digital broadcasting information is erased after it is read out, i.e., pointing to a position which has been pointed to by the reading pointer. Therefore, when a video signal is output, the stored video signal which has been finished in being output is simultaneously erased by utilizing an overwriting function of a storage device and a function of controlling plural pointers, whereby the copyright protection is realized.

[0017] According to a third aspect of the present invention, a digital broadcasting receiver comprises: a tuner unit for receiving digital broadcasting information including copyright information which shows whether copying to an external device is allowed or not, and for detecting the copyright information in the received digital information; an information storage unit for storing the received digital broadcasting information together with the copyright information in the received digital broadcasting information, and a decoder unit for decoding the received digital broadcasting information; or digital broadcasting information read out from the information storage unit into an output signal in a form to be displayed. When a copy-disallowance signal included in the copyright information in the received digital broadcasting information is detected while the received digital broadcasting information is stored in the information storage unit during receiving digital broadcasting information, the digital broadcasting receiver inhibits outputting the received digital broadcasting information as an output signal in a form to be displayed through the decoder unit. Therefore, the copyright protection is further reinforced.

[0018] According to a fourth aspect of the present invention, the digital broadcasting receiver of the third aspect of the present invention inhibits, when a copy-disallowance signal included in the copyright information in the received digital information is detected while the received digital broadcasting information is stored in the information storage unit, outputting the received digital broadcasting information as an output signal in a form to be displayed through the decoder unit, and outputs a message screen signal, which is prepared in advance, to an output unit for outputting an output signal in a form to be displayed through the decoder unit. Therefore, the operation for the copyright protection is further clarified.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIG. 1 is a block diagram illustrating a digital broadcasting receiver according to a first embodiment of the present invention.

[0020] FIG. 2 is a diagram schematically illustrating a structure of program data in the first and second embodiments of the present invention.

[0021] FIG. 3 is a flowchart showing a storing operation in the first embodiment of the present invention.

[0022] FIG. 4 is a flowchart showing a reading and erasing operation in the first and second embodiments of the present invention.

[0023] FIG. 5 is a block diagram illustrating a digital broadcasting receiver according to the second embodiment of the present invention.

[0024] FIG. 6 is a flowchart showing a storing operation in the second embodiment of the present invention.

[0025] FIG. 7 is a block diagram illustrating a prior art digital broadcasting receiver.

[0026] FIG. 8 is a diagram showing, as a table, a control method by an output control unit 27 in the first embodiment of the present invention.

[0027] FIG. 9 is a diagram showing, as a table, a control method by an output control unit 67 in the second embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0028] Hereinafter, embodiments of the present invention will be described with reference to FIGS. 1 to 7.

[0029] First Embodiment

[0030] A first embodiment will be described with reference to FIGS. 1, 2, 3, and 4.

[0031] FIG. 1 is a block diagram illustrating a digital broadcasting receiver according to the first embodiment of the present invention. In FIG. 1, reference numeral 11 denotes a digital broadcasting receiver. Numeral 12 denotes a tuner. Numeral 13 denotes a transport decoder. Numeral 14 denotes a selector switch. Numeral 15 denotes an MPEG decoder. Numeral 16 denotes an NTSC encoder. Numeral 17 denotes a scrambler. Numeral 18 denotes a descrambler. Numeral 19 denotes a recording pointer control unit. Numeral 20 denotes a reading (reproducing) pointer control unit. Numeral 21 denotes a simultaneous erasing pointer control unit. Numeral 22 denotes a hard disk interface. Numeral 23 denotes a hard disk. Numeral 26 denotes an input operation control unit. Numeral 27 denotes an output control unit. The reading (reproducing) pointer control unit 20 and the simultaneous erasing pointer control unit 21 can be collectively referred to as a pointer controller, and the pointer controller, the descrambler 18, and the hard disk interface 22 can be collectively referred to as a control arrangement.

[0032] Hereinafter, an operation of the digital broadcasting receiver having a structure according to the first embodiment will be described.

[0033] The tuner 12 is connected to an antenna. Digital broadcasting received by the tuner 12 is digital-demodulated, and the demodulated broadcasting is input into the transport decoder 13 as a data sequence in the form of a transport stream. The data sequence in a transport stream includes a plurality of programs and control information multiplexed therein, and one of the programs is selected among the plurality of the programs by the transport decoder 13.

[0034] As operation states of the apparatus according to the first embodiment, which can be selected by an operation of a user through the input operation unit 26, there are following three states:

[0035] 1) "direct receiving"-receiving digital broadcasting and reproducing the same upon receipt;

[0036] 2) "indirect receiving and storing"-receiving digital broadcasting and storing the same without reproducing the same upon receipt; and

[0037] 3) "indirect receiving and reproducing"-reproducing the digital broadcasting which is received by the "indirect receiving".

[0038] These three states of "direct receiving", "indirect receiving and storing", and "indirect receiving and reproducing" can be assigned by an input from an operator through the input operation unit 26. In response to the assignment of the three states from the input operation unit 26, the output control unit 27 switches the selector switch (SW) 14 referring to a state of a copy flag, as shown in the table of FIG. 8.

[0039] Hereinafter, detailed descriptions are given for operations in the above-described three states.

[0040] Initially, in the "direct receiving" state, when "direct receiving" is assigned from the input operation unit 26, the selector switch 14 is switched to be connected to the transport decoder 13 controlled by the output control unit 27 (SW 14 is switched to 1, see FIG. 8). The program data of a program selected by the transport decoder 13 is MPEG-decoded by the MPEG decoder 15, and a digital video image (signal) and a voice signal are output. The digital video signal among those is converted into a television signal by the NTSC encoder 16 and the television signal is output.

[0041] FIG. 2 shows a stream structure of the program data selected by the transport decoder 13. Numeral 31 denotes a program data. Numeral 32 denotes a copy bit CB constituting a copy flag. Numeral 33 denotes a packet header. In FIG. 2, the program data 31 selected by the transport decoder 13 comprises packets, and each packet has a packet header 33. The packet header 33 includes a copy bit (CB) 32 indicating a copy flag concerning copyright information. Here, CB=0 means that copying to an external device is allowed and CB=1 means that copying to an external device is disallowed.

[0042] When this apparatus performs an "indirect receiving" operation relating to the "indirect receiving and storing" or "indirect receiving and reproducing", the scrambler 17, the descrambler 18, the recording pointer control unit 19, the reading pointer control unit 20, the simultaneous erasing pointer control unit 21, the hard disk interface 22, and the hard disk 23 elements shown in FIG. 1 are employed.

[0043] FIG. 3 is a flowchart showing a control procedure for storing in the "indirect receiving and storing" operation among the above-described "indirect receiving" operations. As shown in FIG. 3, when the "indirect receiving and storing" is started, initial settings of a receiving initial setting, a storing initial setting, and RP=0 are carried out in step S1. Then, in step S2, the packet header 33 of the program data 31 is examined by the scrambler 17 and the copy flag 32 included therein is judged in step S3. When CB=0, it proceeds to step S4 where data of one packet is pointed to by the recording pointer RP and is transmitted to the hard disk interface (HD-I/F) 22 without being scrambled. When CB=1 in step S3, it proceeds to step S5, and data of one packet pointed to by the recording pointer RP is scrambled and transmitted to the hard disk interface (HD-I/F) 22. The scrambling of data means that data conversion is performed with a specific key for the content of a packet. When data is being stored onto the hard disk 23 in a state of "indirect receiving and storing" and where the copy bit shows the disallowance of copying, the selector switch 14 is in an open state.

[0044] Then, in step S6, referring to the value of the recording pointer RP, the pointer RP pointing to the packet to be stored is incremented by one in the hard disk interface 22, and the program data is transmitted to the hard disk 23, as described above. In step S7, it is decided whether the storage is completed. In this way, the received program data having a time length which is set by the operator is stored in the hard disk 23. As described above, data of one packet pointed to by the recording pointer RP is transmitted to the hard disk interface (HD-I/F) 22 regardless of whether CB=0 or CB=1. Accordingly, reserved digital broadcasting information is stored in the hard disk 23 irrespective of whether copying the received digital broadcasting information to an external device is allowed or not.

[0045] Then, the program data stored in the hard disk 23 is read out from the hard disk 23 and is output through the hard disk interface 22 in the "indirect receiving and reproducing" operation among the above-described "indirect receiving" operations. In this case, as shown in FIG. 1, the selector switch 14 is switched to the side of the descrambler 18 (SW is switched to 2, see FIG. 8), whereby the descrambler 18 is connected with the MPEG decoder 15.

[0046] FIG. 4 is a flowchart showing a control procedure for reading and erasing in the "indirect receiving and reproducing" operation among the above-described "indirect receiving" operations.

[0047] As shown in FIG. 4, when reading is started, initial settings of a reading initial setting, a file opening, a reading pointer PP=0, and a simultaneous erasing pointer EP=0 are performed, and then the hard disk interface 22 reads out the stored program data 31, as shown in FIG. 2, in step S1a.

[0048] The reading pointer PP is operable to point to a position where reading is to be performed. In step S2a, a packet header pointed to by the reading pointer PP is read out. In step S3a, a copy flag CB included in the packet header 33 is judged in the descrambler 18. In accordance with the value of the copy flag CB, it proceeds to step S4a when CB=0, and data of one packet pointed to by the reading pointer PP is transmitted to the MPEG decoder 15 as it is. Then, in step S5a, the reading pointer PP is incremented by one, and the process beginning with Step S2a is continued until the processing for the last packet is finished (this is judged in step S9a).

[0049] When it is judged that CB=1 for the packet header in the read packet in step S3a, it proceeds to step S6a. Since the data of one packet pointed to by the reading pointer PP has been scrambled, the data is descrambled by the descrambler 18 and is transmitted to the MPEG decoder 15. Further, when it is judged CB=1 for this packet header of the read packet, the reading pointer PP, in step S7a, is incremented by one for the next reading and the simultaneous erasing pointer EP is made to have a value which is smaller than the value of the reading pointer PP which is incremented by one. Then, in step S8a, 0 is overwritten onto the entire data of the packet pointed by the simultaneous erasing pointer EP, thereby erasing the data of the packet, the reading of which is already finished. While performing the above-described pointer control, the process beginning with Step 2a is continued until the processing for the last packet is finished (this is judged in step S9a).

[0050] When it is judged YES in step S9a, i.e., when reading from the last packet is finished, the reading-and-erasing processing is ended when it is judged that CB=0 in step S10a. When it is judged that CB=1, it proceeds through step S11a to step S12a where the erasing processing with employing the overwriting is performed for the last packet, thereby performing final erasing, and finishing the reading-and-erasing processing.

[0051] The program data which is controlled to be stored and to be read out as described above is, as shown in FIG. 1, transmitted to the MPEG decoder 15 to be decoded thereby, and a digital video image and a voice are output. The digital video signal is converted into a television signal by the NTSC encoder 6 and the television signal is output. In the descrambler 18, the copy flag CB is separated from the packet header, and the copy flag information 24 is used to control the NTSC encoder 16. When it is judged that CB=1, the NTSC encoder 16 inserts a copy protect pulse into the television signal which is output from the NTSC encoder 16, and the NTSC encoder 14 outputs the program data as a copy-guarded signal.

[0052] As described above, according to this first embodiment, in order to reproduce the received broadcasting at a time later than when the broadcasting is received, the received broadcasting is temporarily stored, and the stored broadcasting is read out to be output later and a copy-disallowance signal for inhibiting copying to an external recording device is stored together with the received broadcasting. Consequently, when the received broadcasting is read out and output, if the copy-disallowance signal is detected, the received and stored broadcasting is read out and output as well as simultaneously erased by performing the above-described overwriting, thereby satisfying the condition of disallowance for copying to an external recording device.

[0053] In the first embodiment, the method of reading and outputting as well as simultaneously erasing the received and stored broadcasting is achieved by performing overwriting which employs the simultaneous erasing pointer EP. However, this method of performing reading and outputting as well as simultaneous erasing can also be achieved by other methods of erasing stored video information associated with performing reading and outputting.

[0054] Further, in the first embodiment, the hard disk 23 is used as a unit for temporarily storing the received digital broadcasting information. However, any high-speed storage devices such as disk devices or semiconductor memories can be similarly employed.

[0055] Second Embodiment

[0056] Next, a second embodiment will be described with reference to FIGS. 2, 4, 5 and 6.

[0057] FIG. 5 is a block diagram illustrating a digital broadcasting receiver according to the second embodiment. In FIG. 5, reference numeral 51 denotes a digital broadcasting receiver. Numeral 52 denotes a tuner. Numeral 53 denotes a transport decoder. Numeral 54 denotes a selector switch (SW). Numeral 55 denotes an MPEG decoder. Numeral 56 denotes an NTSC encoder. Numeral 57 denotes a scrambler. Numeral 58 denotes a descrambler. Numeral 59 denotes a recording pointer control unit. Numeral 60 denotes a reading (reproducing) pointer control unit. Numeral 61 denotes a simultaneous erasing pointer control unit. Numeral 62 denotes a hard disk interface. Numeral 63 denotes a hard disk drive. Numeral 64 denotes a copy flag. Numeral 65 denotes an OSD (On Screen Demand) screen composition unit. Numeral 66 denotes an input operation unit. Numeral 67 denotes an output control unit. Numeral 68 denotes a message screen generating unit. Numeral 69 denotes a selector switch (SW). The descrambler 58, the reading (reproducing) pointer control unit 60, the simultaneous erasing pointer control unit 61, and the hard disk interface 62 can be collectively referred to as a control arrangement.

[0058] Hereinafter, an operation of the digital broadcasting receiver having a structure according to the second embodiment will be described.

[0059] The tuner 52 is connected to the antenna. Digital broadcasting received by the tuner 52 is digital-demodulated, and the demodulated broadcasting is input to the transport decoder 53 as a data sequence in the form of a transport stream. The data sequence in a transport stream includes a plurality of programs and control information multiplexed therein, and one of the programs is selected among the plurality of the programs by the transport decoder 53.

[0060] As operation states of the apparatus according to the second embodiment which can be selected by an operation of a user through the input operation unit 66, there are following three states, which are the same as those in the first embodiment:

[0061] 1) "direct receiving"-receiving digital broadcasting and reproducing the same upon receipt;

[0062] 2) "indirect receiving and storing"-receiving digital broadcasting and storing the same without reproducing the same upon receipt; and

[0063] 3) "indirect receiving and reproducing"-reproducing the digital broadcasting which is received by the "indirect receiving and storing".

[0064] These three states of "direct receiving", "indirect receiving and storing", and "indirect receiving and reproducing", can be assigned by an input from an operator through the input operation unit 66. In response to the assignment of the three states from the input operation unit 66, the output control unit 67 switches the selector switch 54 and switches the selector switch 69, referring to a state of a copy flag, as shown in a table of FIG. 9.

[0065] Hereinafter, detailed descriptions are given for operations in the above-described three states.

[0066] Initially, in the "direct receiving", when "direct receiving" is assigned from the input operation unit 66, the selector switch 54 is switched to be connected to the transport decoder 53 side (SW is switched to 1, see FIG. 9), regardless of whether copying is allowed or disallowed, and the selector switch 69 is made in a connected state when copying is allowed, and is made open when copying is disallowed, controlled by the output control unit 67. In the "direct receiving" state, the program data is MPEG-decoded by the MPEG decoder 55 and a digital video image (signal) and a voice signal are output. When copying is allowed, the program data is stored in the hard disk 63 via the scrambler 57 because the selector switch 69 is turned on. On the other hand, when copying is disallowed, the data is not stored in the hard disk 63 because the selector switch 69 is turned off. In addition, the digital video signal of the program data transmitted to the MPEG decoder 55 side passes through the OSD composition unit 65, and is converted into a television signal by the NTSC encoder 56 and the television signal is output.

[0067] FIG. 2 shows a stream structure of the program data selected by the transport decoder 53, which is the same as that in the first embodiment. Numeral 31 denotes a program data. Numeral 32 denotes a copy flag CB. Numeral 33 denotes a packet header. In FIG. 2, the program data 31 selected by the transport decoder 53 comprises packets, and each packet has a packet header 33. The packet header 33 includes a copy bit (CB) 32 indicating the copy flag concerning copyright information. Here, CB=0 means that copying to an external device is allowed and CB=1 means that copying to an external device is disallowed.

[0068] In the "indirect receiving and reproducing" or "indirect receiving and storing" operation, the scrambler 57, the descrambler 58, the recording pointer control unit 59, the reading (reproducing) pointer control unit 60, the simultaneous erasing pointer control unit 61, the hard disk interface 62, the hard disk drive 63, the OSD composition unit 65, the output control unit 67, and the message screen generating unit 68 elements shown in FIG. 5 are employed.

[0069] When the input operation unit 66 is in the "indirect receiving and storing" state, the output control unit 67 switches the selector SW 54 in accordance with the state of the copy bit 32 of the received digital information. Then, the selector SW 69 is in a connected state in both cases when copying is allowed and when it is disallowed. This has an object of limiting the number of times the viewer can view a broadcasting program, which is protected under the copyright and for which program accounting is performed for each of the programs, so as to perform "storing" and "reproducing" of the broadcasting program in the "indirect receiving", to one time. For that purpose, in the "indirect receiving and storing" state, when the received digital signal is disallowed to be copied, a control procedure as described below is to be performed to inhibit outputting a video image of the received signal.

[0070] FIG. 6 is a flowchart showing the control procedure for the "indirect receiving and storing" operation. As shown in FIG. 6, when the "receiving and storing" operation is started, initial settings of a receiving initial setting, a storing initial setting, and RP=0 are carried out in step S1b. Then, in step S2b, the packet header 33 of the program data 31 is examined by the scrambler 17 and the copy flag 32 included therein is judged in step S3b. When it is judged to be CB=0, it proceeds to step S4b and the output control unit 67 assigns "display the received video image". In this case, the selector switch 54 is switched to be connected to the side of the transport decoder 53, which is the side of a terminal of "1" and the selector switch 69 is made into the connected state. Then in step S5b, the received packet pointed by the recording pointer RP is transmitted to the hard disk interface (HD-I/F) 62 without being scrambled.

[0071] When it is judged that CB=1 in step S3b, it proceeds to step S6b, and the output control unit 67 assigns "display a message screen", and the selector switch 54 is switched to be disconnected and the selector switch 69 is made into the connected state. At this time, the message screen generating unit 68 generates a message showing "the received picture cannot be displayed during the recording operation due to the copyright protection", and the message is displayed on the screen through the OSD composition unit 65. Then in step S7b, data of one packet pointed to by the recording pointer RP is scrambled and transmitted to the hard disk interface (HD-I/F) 62. Scrambling of data means that data conversion is performed with a specific key for the content of the packet. Then, in step S8b, referring to the value of the recording pointer RP, the pointer RP pointing to the packet to be stored is incremented by one in the hard disk interface (HD-I/F) 62, and the program data is transmitted to the hard disk 63. In step S9b, it is judged whether the storage is completed, and when the storage is completed, the received program data having a time length which is set by the operator is stored in the hard disk 63. As described above, data of one packet pointed to by the recording pointer RP is transmitted to the hard disk interface (HD-I/F) 62 irrespective of whether CB=0 or CB=1. Accordingly, received digital broadcasting information is stored in the hard disk 63 irrespective of whether copying the received digital broadcasting information to an external device is allowed or not.

[0072] When the input operation unit 66 assigns the "indirect receiving and reproducing" state, the program data stored in the hard disk 63 is read out from the hard disk 63 and is output through the hard disk interface (HD-I/F) 62. At this time, as shown in FIG. 5, the output control unit 67 judges the operation state and controls the selector switch 54 to connect the descrambler 58 with the MPEG decoder 55 (SW is switched to 2, see FIG. 9). Here, the selector switch 69 can be made either in the connected state or in

an open state.

[0073] FIG. 4 is a flowchart showing a control procedure for the "indirect receiving and reproducing" operation. The operation at this time is similar to the above-described operation, and thus the description thereof is omitted.

[0074] As described above, according to this second embodiment, when a copy-disallowance signal is stored during the "indirect receiving and storing" operation, in order to assure the copyright protection, outputting of a received video signal is inhibited and a message screen is displayed in place of the received video signal, whereby the number of times of viewing the program which is under the copyright protection is limited to only one time. Therefore, when a program which is severely protected under the copyright, such as pay broadcasting, and for which program accounting is performed upon receipt of each program, is received, and even when the viewing time is later shifted, the number of viewing times can be limited to only one time and the protection of the copyright is assured.

INDUSTRIAL APPLICABILITY

[0075] According to the digital broadcasting receiver of the present invention, when a received video signal is disallowed to be copied to an external recording device, the digital broadcasting receiver enables viewing the broadcasting by shifting to a later viewing time, even when the broadcasting cannot be viewed upon receipt, and the digital broadcasting receiver of the present invention realizes the protection of copyright severely also in that case.

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权 利 要 求 书

1. 一种数字广播接收装置，其特征在于，包括：

调谐器部，接收包含表示是否允许外部装置进行复制的著作权信息的数字广播信息，同时，检测出该接收的数字广播信息中的著作权信息；

信息存储部，与在该接收数字广播信息中检测出的著作权信息一起存储上述接收的数字广播信息；

和解码器部，把上述接收的数字广播信息或者从上述信息存储部读出的数字广播信息解码为能够显示的形式输出，

当检测出从上述信息存储部读出的数字广播信息中的不可复制信号时，在从上述信息存储部读出上述数字广播信息，并在显示装置上进行重放显示的重放动作中，删除在上述信息存储部所存储的依次读出的数字广播信息。

2. 根据权利要求1所述的数字广播接收装置，其特征在于，包括指针控制装置，在来自上述信息存储部的数字广播信息重放时，控制来自该信息存储部的信息的读出位置，

该指针控制装置具有：

指示来自上述信息存储部的数字广播信息的读出位置的读出指针，和

用于指示在该读出后删除上述数字广播信息的位置的，指示上述读出指针进行了指示之后的删除指针。

3. 一种数字广播接收装置，其特征在于，包括：

调谐器部，接收包含表示是否允许外部装置进行复制的著作权信息的数字广播信息，同时，检测出该接收的数字广播信息中的著作权信息；

信息存储部，与该接收数字广播信息中的著作权信息一起存储上述接收的数字广播信息；

和解码器部，把上述接收的数字广播信息或者从上述信息存储

部读出的数字广播信息解码为能够显示的形式输出，

在接收数字信息的过程中，当把该接收的数字信息记录到上述信息存储部中时，在检测出该接收数字广播信息中的著作权信息中包含的不可复制信号的情况下，禁止把上述接收数字信息通过上述解码器部作为能够显示的输出来进行输出。

4. 根据权利要求3所述的数字广播接收装置，其特征在于，当把上述数字信息存储到上述信息存储部中时，在检测出上述接收数字广播信息中的上述著作权信息中包含的不允许复制信号的情况下，禁止把上述接收数字信息通过上述解码器部作为能够显示的输出来进行输出，并通过上述解码器部，向能够进行显示的输出部输出预先准备的消息画面信号。

数字广播接收装置

技术领域

本发明涉及数字广播接收装置，特别是在数字广播的著作权保护下的防止不法复制上具有特征的装置。

背景技术

在现有技术中，当数字广播接收装置显示接收的图象信号时，在接收的图象信号不允许复制的情况下，对显示的输出图象信号设置复制防护。

图 7 表示现有的数字广播接收装置的构造。在图 7 中，1 是数字广播接收装置，2 是调谐器，3 是传输解码器，4 是切换开关，5 是 MPEG 解码器，6 是 NTSC 编码器，7 是数字接口，8 是复制标志信息。

对于这样构成的数字广播接收装置，下面对其动作进行说明。

首先，调谐器 2 连接在天线上，由调谐器 2 接收的数字广播被进行数字解调，变成传输流的数据串而输入到传输解码器中。在传输流的数据串中复用了多个节目和控制信息，由传输解码器 3 选择一个节目，从该传输流的数据串中分离出许可还是不许可外部记录装置进行复制的复制标志信息。在正常的接收时，切换开关 4 连接在传输解码器侧，节目数据由 MPEG 解码器 5 进行 MPEG 解码，而输出数字图象和声音。其中的数字图象信号由 NTSC 编码器 6 转换成电视信号而输出。由传输解码器 3 所分离的复制标志信息 8 与数字接口 7 和 NTSC 编码器 6 相连接。在复制标志信息 8 表示不许可外部的记录装置进行复制的情况下，通过数字接口 7，在节目数据的数字输出中插入不许可复制的指示信息，并且通过 NTSC 编码器 6 在从 NTSC 编码器 6 所输出的电视信号中插入复制防护脉冲。

这样，在现有的数字广播接收装置中，存在的问题：当不

许可外部的记录装置复制接收的图象信号的时，不能把其录象到VTR等中，因此，观众只能在接收广播的时刻收看该节目。

鉴于上述问题，本发明的目的是提供一种数字广播接收装置，能够在接收广播时刻以后收看该节目，并且，当接收不允许复制的广播时，能够满足该不允许复制的条件。

为了解决上述问题，本发明的数字广播接收装置，具有：调谐器部，接收包含表示是否允许外部装置进行复制的著作权信息的数字广播信息，同时，检测出该接收的数字广播信息中的著作权信息；信息存储部，与在该接收数字广播信息中检测出的著作权信息一起存储接收的数字广播信息；和解码器部，把上述接收的数字广播信息或者从上述信息存储部读出的数字广播信息解码为能够显示的形式输出；并当检测出从上述信息存储部读出的数字广播信息中的不可复制信号时，从上述信息存储部读出上述数字广播信息，并在显示装置上进行重放显示，在该重放动作中，删除在上述信息存储部所存储的依次读出的数字广播信息。

并且，在接收数字信息的过程中，当把该接收的数字信息记录到上述信息存储部中时，在检测出该接收数字广播信息中的著作权信息中包含的不可复制信号的情况下，禁止把上述接收数字信息通过上述解码器部作为能够显示的输出来进行输出。而且，当把上述数字信息存储到上述信息存储部中时，在检测出上述接收数字广播信息中的上述著作权信息中包含的不允许复制信号的情况下，向能够进行显示的输出部输出预先准备的消息画面信号。

根据本发明，即使在不允许外部的记录装置复制接收的图象信号的情况下，观众也能在广播的接收时刻以后的时间内进行收看，并能够实现此时的著作权保护。

根据本发明，为了进一步确实地进行著作权保护，在存储不允许复制的数字广播信息的过程中，禁止接收中的图象信号的输出，由此，能够把著作权被保护的节目的收看次数限制为一次。

发明概述

本发明(权利要求1)所涉及的数字广播接收装置,其特征在于,包括:调谐器部,接收包含表示是否允许外部装置进行复制的著作权信息的数字广播信息,同时,检测出该接收的数字广播信息中的著作权信息;信息存储部,与在该接收数字广播信息中检测出的著作权信息一起存储上述接收的数字广播信息;和解码器部,把上述接收的数字广播信息或者从上述信息存储部读出的数字广播信息解码为能够显示的形式的输出;并当检测出从上述信息存储部读出的数字广播信息中的不可复制信号时,在从上述信息存储部读出上述数字广播信息,并在显示装置上进行重放显示的重放动作中,删除在上述信息存储部所存储的依次读出的数字广播信息。由此,在接收的数字广播信息是不允许外部的记录装置进行记录的情况下,把上述接收的数字广播信息暂时存储在内部,当输出该信号时,同时删除该暂时存储并依次读出的数字广播信息,由此,能够进行上述接收的数字广播信息的著作权保护。

本发明(权利要求2)所涉及的数字广播接收装置,在权利要求1所述的数字广播接收装置中,包括指针控制装置,在来自上述信息存储部的数字广播信息重放时,控制来自该信息存储部的信息的读出位置,该指针控制装置具有指示来自上述信息存储部的数字广播信息的读出位置的读出指针,和用于指示在该读出后删除上述数字广播信息的位置的,指示上述读出指针进行指示之后的删除指针。由此,使用存储装置的重写功能和能够控制多个指针的功能,当输出图象信号时,同时删除输出结束的所存储的图象信号,从而能够实现著作权保护。

本发明(权利要求3)所涉及的数字广播接收装置,其特征在于,包括:调谐器部,接收包含表示是否允许外部装置进行复制的著作权信息的数字广播信息,同时,检测出该接收的数字广播信息中的著作权信息;信息存储部,与该接收数字广播信息中的著作权信息一起存储上述接收的数字广播信息;和解码器部,把上述接收的数

字广播信息或者从上述信息存储部读出的数字广播信息解码为能够显示的形式输出；并在接收数字信息的过程中，当把该接收的数字信息记录到上述信息存储部中时，在检测出该接收数字广播信息中的著作权信息中包含的不可复制信号的情况下，禁止把上述接收数字信息通过上述解码器部作为能够显示的输出来进行输出。由此，能够进一步强化著作权保护。

本发明（权利要求 4）所涉及的数字广播接收装置，在权利要求 3 所述的数字广播接收装置中，当把上述数字信息存储到上述信息存储部中时，在检测出上述接收数字广播信息中的上述著作权信息中包含的不允许复制信号的情况下，禁止把上述接收数字信息通过上述解码器部作为能够显示的输出来进行输出，并通过上述解码器部，向能够进行显示的输出部输出预先准备的消息画面信号。由此，能够使著作权保护的動作成为更明确的。

附图的简要说明

图1是本发明的实施例 1 的数字广播接收装置的方框图；

图2是用于示意地说明本发明的实施例 1 和 2 中的节目数据的构成的图；

图3是表示本发明的实施例 1 中的存储时的动作的流程图；

图4是表示本发明的实施例 1 和 2 中的读出删除时的动作的流程图；

图5是本发明的实施例 2 所涉及的数字广播接收装置的方框图；

图6是表示本发明的实施例 2 中的存储时的动作的流程图；

图7是现有的数字广播接收装置的方框图；

图8是作为表格来表示本发明的实施例 1 中的输出控制部 27 的控制方法的图；

图9是作为表格来表示本发明的实施例 2 中的输出控制部 67 的控制方法的图。

用于实施发明的最佳实施例

下面使用图 1 至图 7 来说明本发明的实施例。

实施例 1

使用图 1、图 2、图 3 和图 4 来对与本发明的权利要求 1 和权利要求 2 相对应的实施例 1 进行说明。

图 1 表示本发明的实施例 1 的数字广播接收装置的方框图，在图 1 中，11 是数字广播接收装置，12 是调谐器，13 是传输解码器，14 是切换开关，15 是 MPEG 解码器，16 是 NTSC 编码器，17 是扰频器，18 是去扰频器，19 是记录指针控制部，20 是读出（重放）指针控制部，21 是同时删除指针控制部，22 是硬盘接口，23 是硬盘，26 是输入操作部，27 是输出控制部。

下面对这样构成的本实施例 1 的数字广播接收装置的动作进行说明。

首先，调谐器 12 连接在天线上，由调谐器 12 接收的数字广播被进行数字解调，成为传输流的数据串而被输入传输解码器 13。在传输流的数据串中复用了多个节目和控制信息，而由传输解码器 13 选择一个节目。

作为本实施例 1 的装置的动作状态，即，根据用户的操作，成为输入操作部 26 能够操作的状态，存在下列 3 个状态：

- 1) 接收数字广播，在接收的同时进行重放的“直接接收”；
- 2) 接收数字广播，在接收的同时不进行重放而进行存储的“间接接收存储”；
- 3) 重放进行了上述“间接接收存储”的数字广播的“间接接收重放”。

该“直接接收”、“间接接收存储”、“间接接收重放”的 3 种状态能够由操作者通过上述输入操作部 26 来指定，因此，根据来自该输入操作部 26 的三个状态的指定，输出控制部 27 按图 8 的表所示的那样参照复制标志的状态来切换切换开关 14。

下面详细说明上述三个状态的动作。

首先，在上述“直接接收”时，当从输入操作部 26 指定“直接接收”时，通过输出控制部 27，切换开关 14 连接在传输解码器 13 侧（SW14 切换是 1，参照图 8），由传输解码器 13 所选出的节目的节目数据由 MPEG 解码器 15 进行 MPEG 解码，而输出数字图象和声音。其中的数字图象信号由 NTSC 编码器 16 变换为电视信号而输出。

图 2 表示由传输解码器 13 所选择的节目数据的流构造，31 是节目数据，32 是形成复制标志的复制比特 CB，33 是包首部。在图 2 中，由传输解码器 13 所选择的节目数据 31 被分成为包，在各个包中具有包首部 33。在包首部 33 中具有表示著作权信息的复制标志的复制比特（CB）32。其中，CB=0 表示许可外部复制，CB=1 表示不许可外部复制。

本装置在进行上述“间接接收存储”或者“间接接收重放”的“间接接收”动作的情况下，使用图 1 中的扰频器 17、去扰频器 18、记录指针控制部 19，读出指针控制部 20、同时删除指针控制部 21、硬盘接口 22 以及硬盘 23 等组成部分。

图 3 是表示上述“间接接收”中的“间接接收存储”的动作中的存储时的控制程序的流程图。如图 3 所示的那样，当“间接接收存储”启动时，在步骤 S1 中，在进行了接收初始设定、存储初始设定、RP=0 的初始设定之后，在步骤 S2 中，由扰频器 17 分析节目数据 31 的包首部 33，在步骤 S3 中，判别其中的复制比特 32，如果 CB=0，则进到步骤 S4，不对存储指针 RP 指示的 1 包进行扰频，而送给硬盘接口（HD-I/F）22，在步骤 S3 中，如果 CB=1，则进到步骤 S5，对该存储指针 RP 指示的 1 包施加扰频，并送给硬盘接口（HD-I/F）22。其中，所谓施加扰频是表示用特定的密钥对包的内容变换数据。在该“间接接收存储”的状态下，并且，在复制比特表示不可复制的状态时的向硬盘 23 的存储时，切换开关 14 成为打开的状态。

接着，在步骤 S6 中，由硬盘接口 22 一边参照存储指针 RP 的值

一边使该存储的存储指针 RP 每次一个地递增，如上述那样，把节目数据送给硬盘 23，在步骤 S7 中，判定存储是否结束，这样，由操作者所设定的时间长度的接收节目数据被存储在硬盘 23 中。

接着，在上述硬盘 23 中所存储的节目数据，在上述“间接接收”中的“间接接收重放”的动作中，通过硬盘接口 22 从硬盘 23 中读出并被输出，在此情况下，在图 1 中，切换开关 14 被切换到去扰频器 18 侧（SW 切换为 2，参照图 8），把去扰频器 18 与 MPEG 解码器 15 连接起来。

图 4 是表示上述“间接接收”中的“间接接收重放”的动作中的读出删除时的控制程序的流程图。

在图 4 中，当读出开始时，在步骤 S1a 中，在进行了读出初始设定、文件打开、读出指针 PP=0、同时删除指针 EP=0 的初始设定之后，硬盘接口 22 读出按图 2 所示那样所存储的节目数据 31。

指示读出位置的是读出指针 PP，在步骤 S2a 中，首先，读出读出指针 PP 指示的包首部，在步骤 S3a 中，判断在包首部 33 中包含的复制标志 CB，在去扰频器 18 中，根据复制标志 CB 的值，如果 CB=0，则进到步骤 S4a，而把读出指针 PP 指示的 1 包的数据原封不动地送给 MPEG 解码器 15。接着，在步骤 S5a 中，一边使读出指针 PP 每次一个地递增，一边继续处理，直到最终包的处理结束（由步骤 S9a 进行判断）为止。

并且，在步骤 S3a 中，如果读出包的包首部为 CB=1，则进到步骤 S6a，由于读出指针 PP 指示的 1 包的数据已被扰频，因此，为了解除该扰频，由去扰频器 18 进行去扰频，送给 MPEG 解码器 15。此外，在该读出包的包首部为 CB=1 的情况下，在步骤 S7a 中，读出指针 PP 为了进行下一个读出而递增一个，同时，使同时删除指针 EP 成为比读出指针 PP 少一个的值。接着，在步骤 S8a 中，对于同时删除指针 EP 指示的包，把包的全部数据重写为 0，由此，删除了已经读出的包的数据。接着，一边进行以上的指针控制，一边继续进行处理，直到最终包的处理结束（由步骤 S9a 进行判断）为止。

在步骤 S9a 中，当判断为 YES 时，即，当读出最终包时，在步骤 S10a 的判断中，如果 CB=0，原封不动地结束读出删除处理，而如果 CB=1，则经过步骤 S11a，在步骤 S12a 中，为了进行最终的删除，对于最后的包，进行基于重写的删除处理，使读出删除处理结束。

如以上那样，进行了存储、读出的控制的节目数据，在图 1 中，被送给 MPEG 解码器 15，进行解码，而输出数字图象和声音。该数字图象信号由 NTSC 编码器 6 变换为电视信号并输出。在去扰频器 18 中，从包首部分离出复制标志 CB，作为复制标志信息 24，来控制 NTSC 编码器 16。在 NTSC 编码器 16 中，当 CB=1 时，在从 NTSC 编码器 16 所输出的电视信号中插入复制防护脉冲，把该节目数据作为进行了复制保护的信号来输出。

这样，在本发明的实施例 1 中，为了能够在接收的时刻之后的时刻重放接收的广播，把接收的广播进行暂时存储，在其后进行读出并输出，并且，与上述接收的广播一起存储禁止外部记录装置进行复制的不许可复制的信号，结果，当读出上述接收的广播并输出时，在检测出该不许可复制信号时，读出并输出上述接收并存储的广播信息，与此同时，进行重写而将其删除，因此，能够满足不许可外部记录装置进行复制的条件。

在本实施例 1 中，作为在进行读出和输出上述接收并存储的广播的同时进行删除的方法，使用同时删除指针 EP 进行重写，由此来实现上述目的，但是，作为在进行该读出输出的同时进行删除的方法，可以使用其他的方法，来与读出删除联动地删除所存储的图象信息。

在本实施例 1 中，作为把接收的数字广播信息暂时存储在内部的装置，使用了硬盘 23，但是，不言而喻，同样可以利用其他的盘装置和半导体存储器等高速记录装置。

实施例 2

下面使用图 2、图 3、图 4、图 5 和图 6 来对与本发明的权利要

求 3 和权利要求 4 相对应的实施例 2 进行说明。

图 5 表示本发明的实施例 2 的数字广播接收装置的方框图，在图 5 中，51 是数字广播接收装置，52 是调谐器，53 是传输解码器，54 是切换开关，55 是 MPEG 解码器，56 是 NTSC 编码器，57 是扰频器，58 是去扰频器，59 是存储指针控制部，60 是读出指针控制部，61 是同时删除指针控制部，62 是硬盘接口，63 是硬盘驱动器，64 是复制标志，65 是 OSD (On Screen Demand) 画面合成部，66 是输入操作部，67 是输出控制部，68 是消息画面生成部，69 是切换开关。

下面对这样构成的本实施例 2 的数字广播接收装置的动作进行说明。

首先，调谐器 52 连接在天线上，由调谐器 52 接收的数字广播被进行数字解调，成为传输流的数据串而被输入传输解码器 53。在传输流的数据串中复用了多个节目和控制信息，但由传输解码器 53 选择一个节目。

作为本实施例 2 的装置的动作状态，即，根据用户的操作成为输入操作部 26 能够操作的状态，与上述实施例 1 相同，存在下列 3 个状态：

- 1) 接收数字广播，在接收的同时进行重放的“直接接收”；
- 2) 接收数字广播，在接收的同时不进行重放而进行存储的“间接接收存储”；
- 3) 重放进行了上述“间接接收存储”的数字广播的“间接接收重放”。

该“直接接收”、“间接接收存储”、“间接接收重放”的 3 种状态能够由操作者通过上述输入操作部 66 来指定，因此，根据来自该输入操作部 66 的三个状态的指定，输出控制部 67 按图 9 的表所示的那样参照复制标志的状态来切换切换开关 54，并且，切换切换开关 69。

下面详细说明上述三个状态的动作。

首先，在上述“直接接收”时，当从输入操作部 66 指定“直接

接收”时，通过输出控制部 67，切换开关 54 被控制得与许可复制或不可复制无关地连接在传输解码器 53 侧（SW14 切换是 1，参照图 9），切换开关 69 在许可复制的情况下成为连接状态，在不可复制的情况下被打开。这样，在该“直接接收”时，节目数据由 MPEG 解码器 55 进行 MPEG 解码，而输出数字图象和声音，但在其中的许可复制时，该节目数据因切换开关 69 是接通的而通过扰频器 57 被存储到硬盘 63 中，在其中的不可复制时，因切换开关 69 是断开的，不会存储到硬盘 63 中。并且，进入到上述 MPEG 解码器 55 侧的节目数据的数字图象信号通过 OSD 合成部 65，由 NTSC 编码器 56 变换为电视信号而输出。

图 2 与上述实施例 1 时相同表示由传输解码器 53 所选择的节目数据的流构造，31 是节目数据，32 是复制比特 CB，33 是包首部。在图 2 中，由传输解码器 13 所选择的节目数据 31 被分成为包，在各个包中具有包首部 33。在包首部 33 中具有表示著作权信息的复制标志的复制比特（CB）32。其中，CB=0 表示许可外部复制，CB=1 表示不可外部复制。

在进行上述“间接接收存储”或者“间接接收存储”的动作的情况下，使用图 5 中的扰频器 57、去扰频器 58、存储指针控制部 59、读出（重放）指针控制部 60、同时删除指针控制部 61、硬盘接口 62、硬盘驱动器 63、OSD 画面合成部 65、输出控制部 67 以及消息画面生成部 68 等组成部分。

当输入操作部 66 为上述“间接接收存储”的状态时，输出控制部 67 通过接收的数字信息的复制比特 32 的状态来切换切换开关 54。此时，切换开关 69 即使在许可复制或不可复制任一种状态下都处于连接状态。其目的是为了在“间接接收”中的“存储”以及“重放”时，把每个节目需付费这样的著作权被保护的广播节目的次数限制为收看者收看一次。由此，当“间接接收存储”时，在接收数字信号为不可复制的情况下，为了禁止接收信号的图象输出，而采用下述这样的控制程序。

图 6 是表示上述“间接接收存储”时的控制程序的流程图。如图 6 所示的那样，当“接收存储”开始进行时，在步骤 S1b 中，在进行了接收初始设定、存储初始设定、RP=0 的初始设定之后，在步骤 S2b 中，由扰频器 17 分析节目数据 31 的包首部 33，在步骤 S3b 中，判别其中的复制比特 32，如果 CB=0，则进到步骤 S4b，输出控制部 67 指定“接收图象显示”，切换开关 54 连接在“1”的端子侧的传输解码器 53 上，切换开关 69 成为连接状态。接着，在步骤 S5b 中，不对存储指针 RP 指示的接收的包进行扰频，而送给硬盘接口 (HD-I/F) 62。

在步骤 S3b 中，如果 CB=1，则进到步骤 S6b，输出控制部 67 指定“消息画面显示”，切换开关 54 被切断，切换开关 69 成为连接状态。此时，在消息画面生成部 68 中，生成「为了著作权保护，存储动作中不能显示接收画面」这样的通知。并通过 OSD 画面合成部 65 显示在画面上。接着，在步骤 S7b 中，对存储指针 RP 指示的 1 包施加扰频，并送给硬盘接口 (HD-I/F) 62。其中，所谓施加扰频是表示用特定的密钥对包的内容变换数据。接着，在步骤 S8b 中，一边参照存储指针 RP 的值，一边使存储的包的指针 RP 递增一个，把节目数据送给硬盘 63，在步骤 S9b 中，判断存储是否结束，把由操作者所设定的时间长度的接收节目数据存储到硬盘 63 中。

在输入操作部 66 指定上述“间接接收重放”的状态时，在硬盘 63 中所存储的节目数据通过硬盘接口 (HD-I/F) 62 从硬盘 63 读出，并被输出。此时，在图 5 中，输出控制部 67 判断动作状态，控制切换开关 54 以便于把去扰频器 58 和 MPEG 解码器 55 连接起来 (SW 切换 2，参照图 9)。此时，切换开关 69 可以是连接或者断开的状态。

图 4 是表示上述“间接接收重放”时的控制程序的流程图，因该部分的动作与其相同而省略其说明。

这样，在本发明的实施例 2 中，为了确实进行著作权保护，在“间接接收存储”的动作中，当存储不许可复制的信号时，禁止接

收中的图象信号输出，而显示取代其的消息画面，由此，能够把著作权被保护的节目的收看次数限制为一次。由此，即使在每个节目在接收时需付费的收费广播等著作权被严格保护的节目的接收中，即使把其收看时刻向后推移，能够把收看次数限制为一次，而能够确实地实现著作权保护。

产业上的利用可能性

根据本发明的数字广播接收装置，在不许可外部的记录装置复制接收的图象信号的情况下，即使在广播接收时不能收看，也可以把收看时刻向后推移来进行收看，而且，能够严格地进行这种情况下的著作权保护。

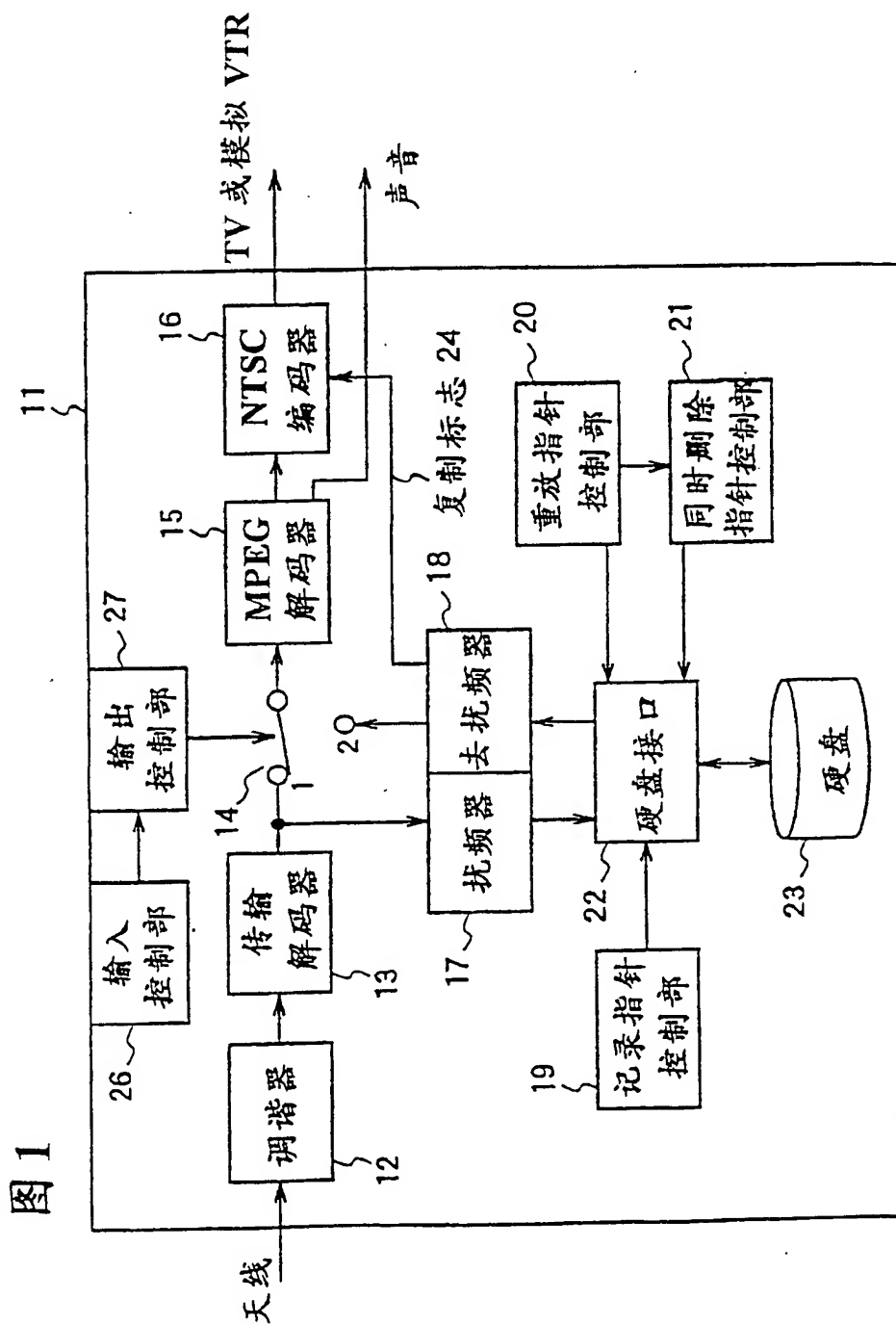
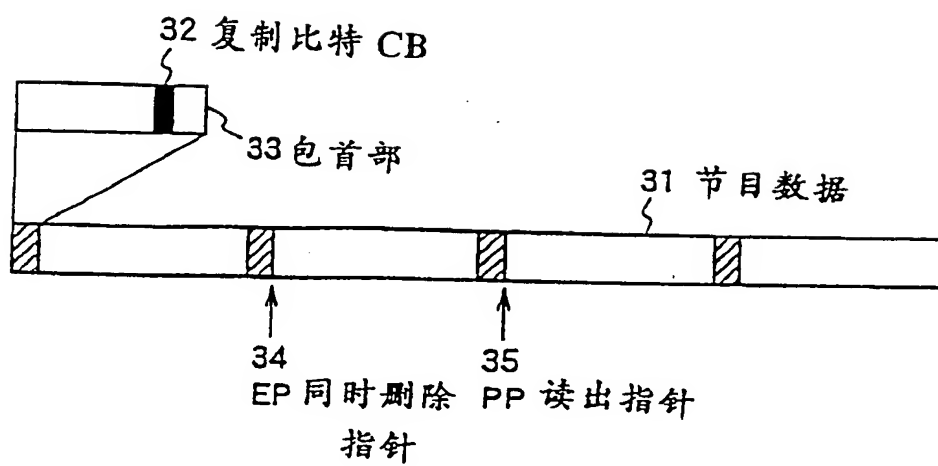


图 1

图 2



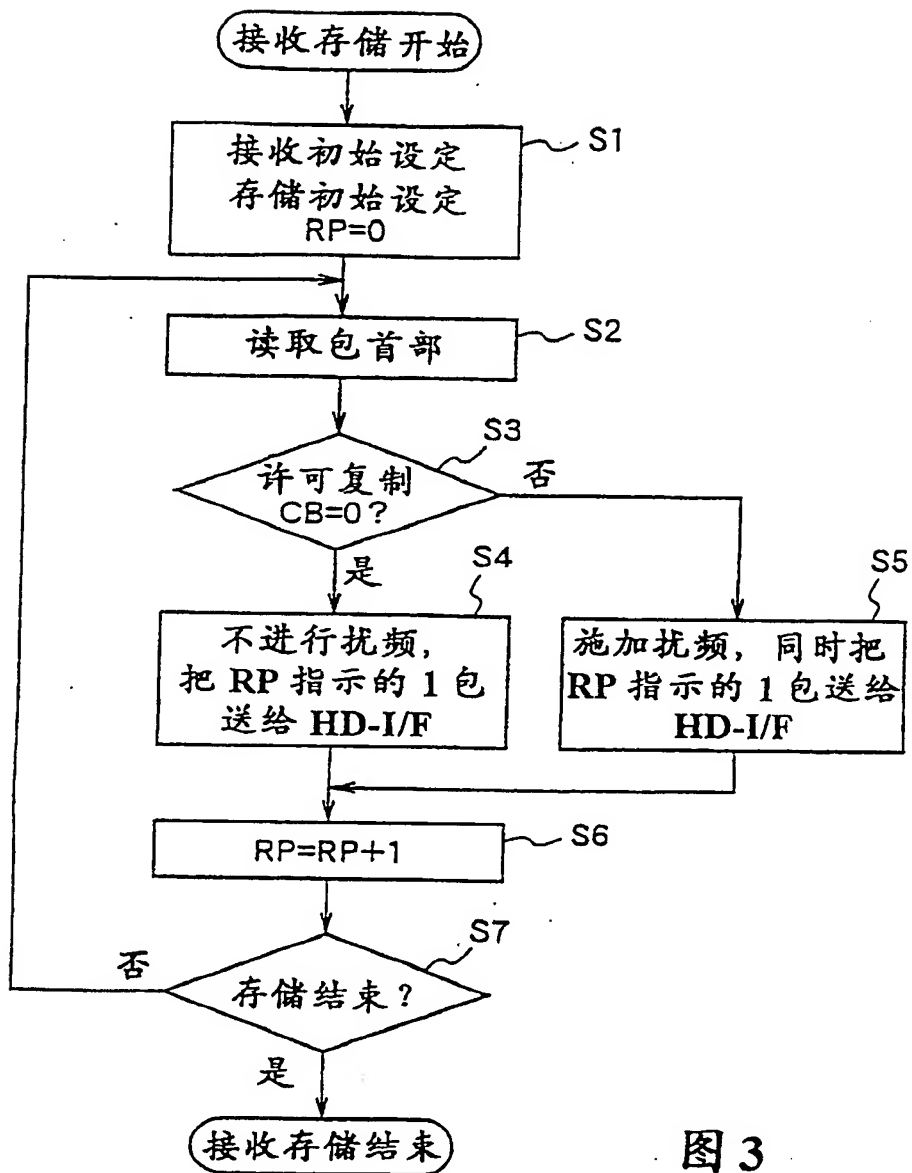


图 3

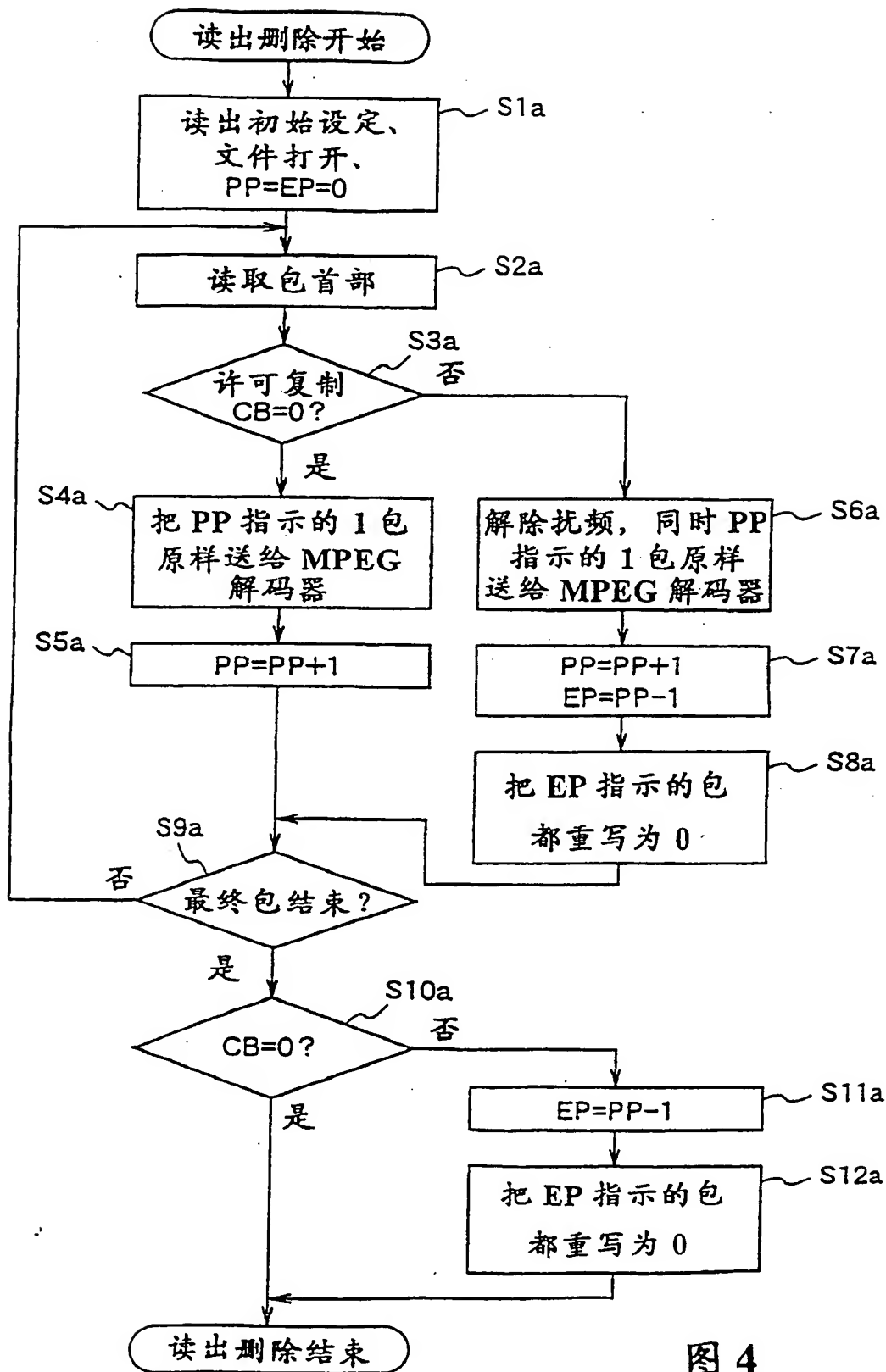
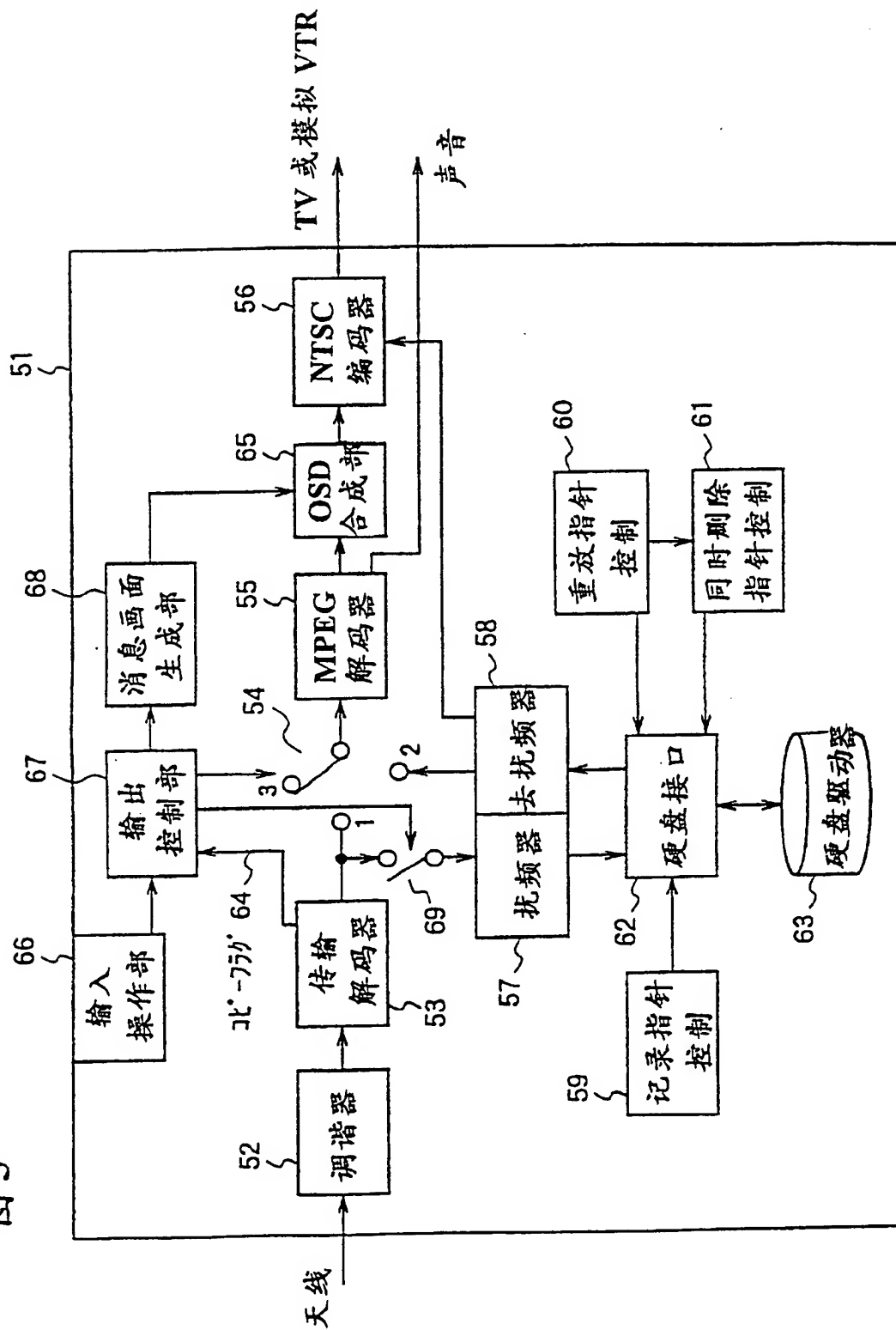


图 4

000000

图5



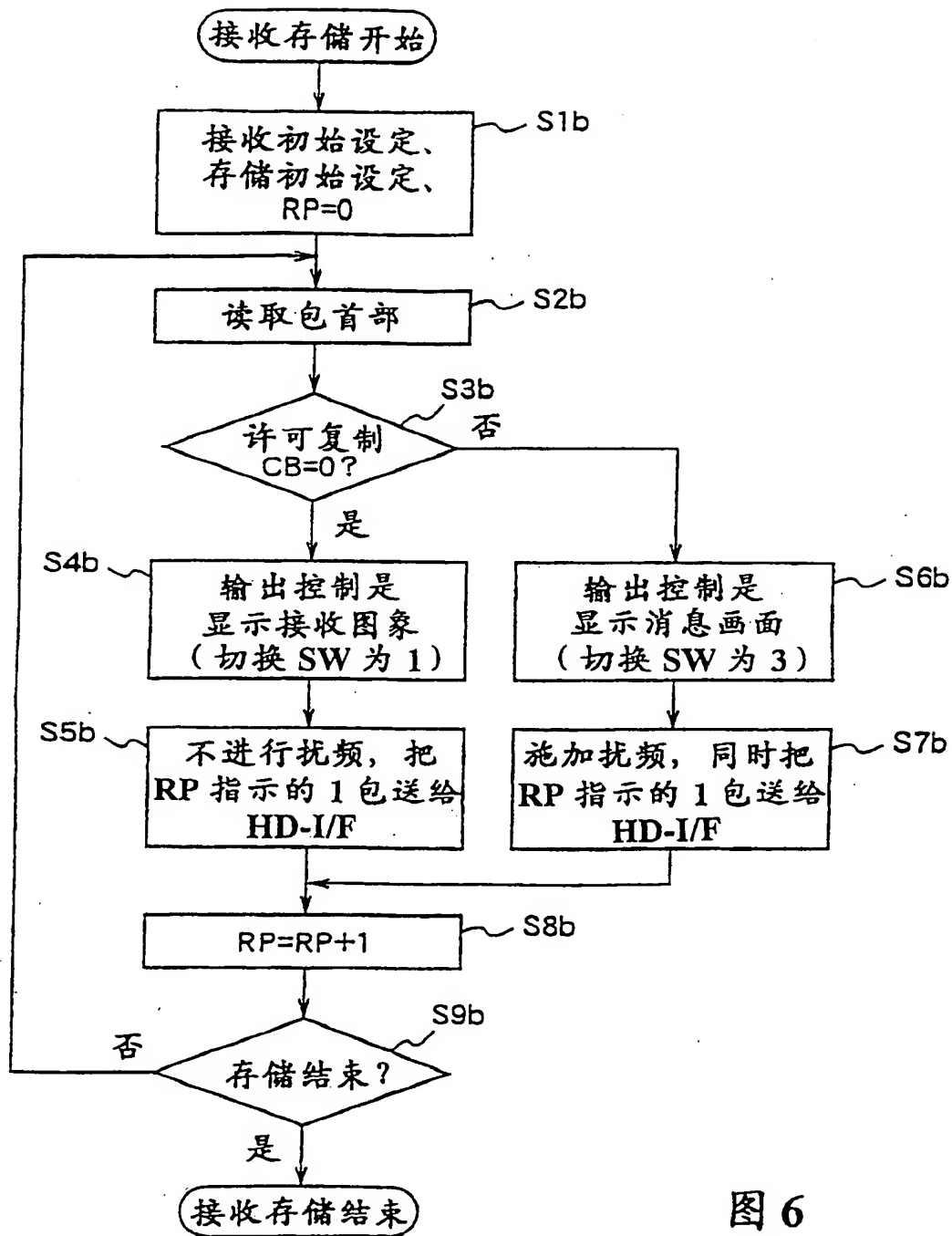


图 6

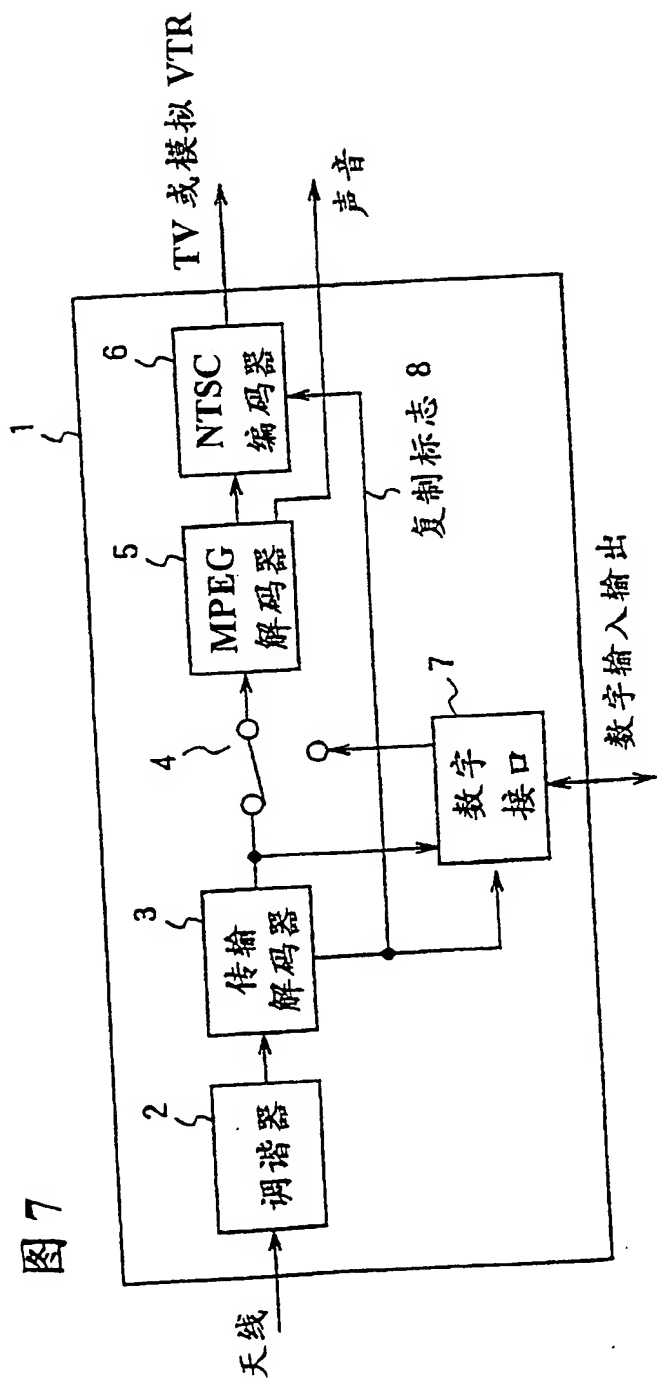


图 8

输入操作状态	复制标志状态	SW14
直接接收输出	许可复制	接收图象显示 (切换 SW 为 1)
	不许可复制	接收图象显示 (切换 SW 为 1)
间接接收存储	许可复制	接收图象显示 (切换 SW 为 1)
	不许可复制	没有图象显示 (切换 SW 断开)
间接接收重放	许可复制	重放画面显示 (切换 SW 为 2)
	不许可复制	重放画面显示 (切换 SW 为 2)

图 9

输入操作状态	复制标志状态	SW54		SW69
		接收图象显示(切换 SW 为 1)	连接	
直接接收输出	许可复制	接收图象显示(切换 SW 为 1)	打开	
	不许可复制	接收图象显示(切换 SW 为 1)	连接	
间接接收存储	许可复制	消息画面显示(切换 SW 为 3)	连接	
	不许可复制	重放画面显示(切换 SW 为 2)	无关	
间接接收重放	许可复制	重放画面显示(切换 SW 为 2)	无关	
	不许可复制	重放画面显示(切换 SW 为 2)	无关	